Telephony

ISDN

SPECIAL

SUPPLEMENT TO TELEPHONY

Telephony

EDITORIAL

Editor
CAROL WILSON

Managing Editor
KAREN WOODWARD

Executive News Editor
PAUL TRAVIS

Technical Editor
MICHAEL WARR

International Editor
JOHN WILLIAMSON

Washington Editor
CHARLES MASON

Special Projects Editor
SUSAN UBIS

Outside Plant Editor
LLOYD F. (FRANK) BRISK

Associate Editor
DEBORAH PFEIFFER

Assistant Editors
DAWN M. BUSHAUS
ANN LINDSTROM

Art Director
LAURA M. DOYLE

Editorial Secretary
ALESIA MURRY

ADMINISTRATION

Group Vice President
JOHN WICKERSHAM

Publisher
LARRY LANNON

Associate Publisher
CZATDANA INAN

Publishing Consultant
LEO ANDERSON

ADVERTISING & MARKETING

Advertising Sales Director
MARK HICKEY

Marketing Coordinator
MAURA C. GOODMAN

Printing Services Manager
BARBARA HURD

Advertising Production Coordinators
LYNITA BARLOW
YOLANDA LEWIS
JEANNE VALENTINE

CIRCULATION

Circulation Director
CYNTHIA CARDINAL

Circulation Manager
CHRIS LOTESTO

For Customer Service contact:
Telephony
P.O. Box 12901
Overland Park, KS 66212-0901
1-800-972-5858

HEADQUARTERS OFFICE

TELEPHONY DIVISION,
Intertec Publishing, 55 E. Jackson,
Chicago, IL 60604
Telephone 312/922-2435
TWX 910/221-1058 FAX 312/922-1408

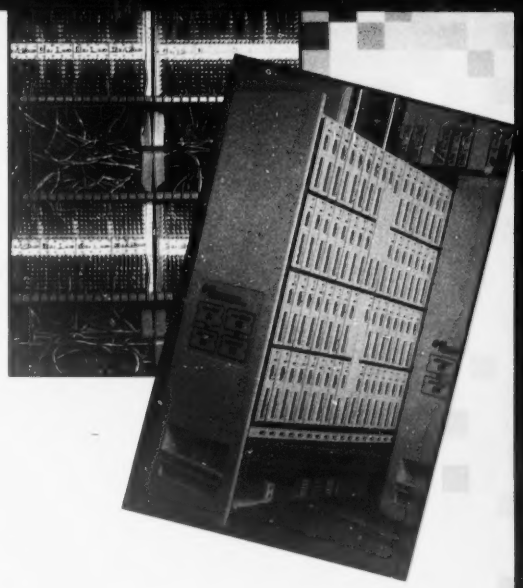
EUROPEAN BUREAU, 71 Coval Lane,
Chelmsford, Essex CM1 1TG, England
Telephone Chelmsford (0245) 283984

WASHINGTON OFFICE,
National Press Building
529 14 St., N.W., Room 962
Washington, D.C. 20045
Telephone 202/872-0465
FAX 202/872-0469

INTERTEC

Cover photography by
Vicki Grayland.
Inside photography by
Steve Donisch, Geoff Scheerer
and Vicki Grayland

Special thanks to Ameritech,
Illinois Bell and AT&T
Bell Labs for the use of their
ISDN facilities in Chicago
and Naperville, Ill.



CONTENTS

February 1990
Volume 218, No. 6B

Introduction 6

Beyond the ISDN island 7
by Michael Warr

Users find ISDN pays off 12
by Dawn Bushaus and Paul Travis

The IXCs and ISDN:
It's not AT&T's playground anymore 18
by Susan Ubis

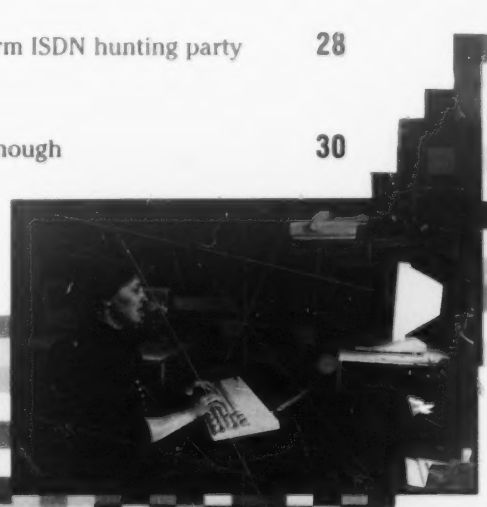
ISDN CPE on a growth curve 20
by Carol Wilson and Deborah Pfeiffer

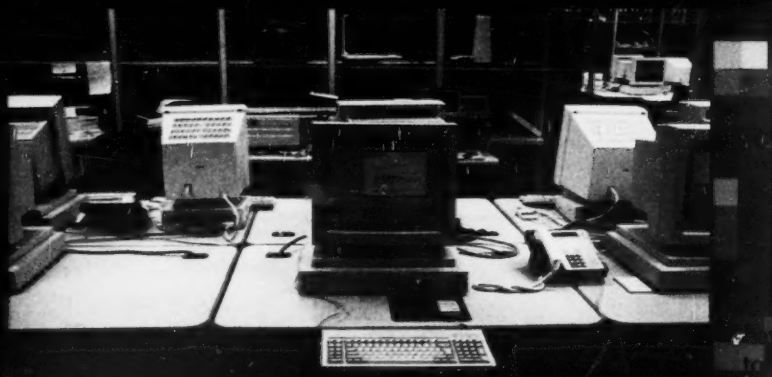
Marketing issues still loom large 24
by Bob Vinton

The desktop will be the last ISDN frontier 26
by Karen Woodward

Big and small vendors form ISDN hunting party 28
by Ann Lindstrom

When a standard is not enough 30
by Michael Warr





User pays

DAWN BUSHAUS
Assistant Editor

PAUL TRAVIS
Executive News Editor

For years, the critics said "ISDN" stood for "innovations subscribers don't need" or "it still does nothing." That no longer is true, according to communications managers who are using ISDN today.

It still will take many years before ISDN fulfills the promise of providing a seamless, ubiquitous network with end-to-end integrated digital transmission of voice, data and video signals. But dozens of communications managers said in recent interviews that they are enjoying some of the benefits of ISDN now—and they expect to enjoy many more in the future.

The benefits available today include reduced communications costs, greater flexibility in allocating bandwidth, cleaner transmission lines, faster data transmission speeds, easier wiring schemes, improved employee productivity, and several new features and applications.

There still are problems, ISDN users are quick to acknowledge. ISDN customer premises equipment is in short supply and usually very expensive. Development of innovative applications has been slow. Service is available only in limited areas. Tariffing and pricing questions remain unresolved. Interconnection between LATAs is available, local exchange carriers have been slow to deploy signaling system 7.

Overall, most users of ISDN say they are pleased with their experiences to date. The benefit has

Nevada Bell

kb/s data link. "In effect, we get

free channels because the 56 kb/

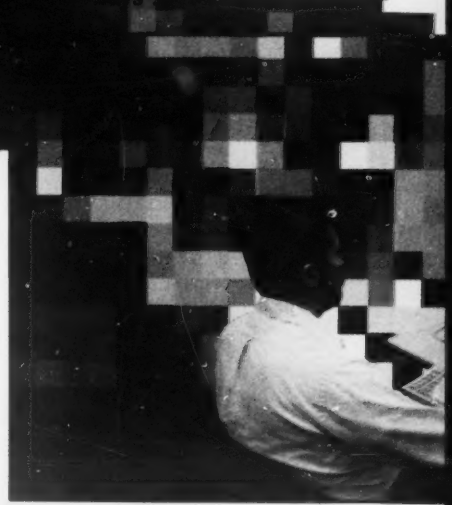
costs about the same as the T-1," says Steve Backe, manager of computer operations and telecommunications. He reports that overall communications costs dropped from about $25,000 a month to $20,000 once ISDN was implemented

CSX Corp. replaced seven T-1 lines with five primary rate lines at its Jacksonville, Fla., office. The lines mostly carry voice traffic, but the company is making use of automatic number identification, according to Preston Lawson, senior director of telecommunications engineering. CSX expects to save about $30,000 annually.

Comdisco Disaster Recovery Services Inc. is saving about $2700 a month using an AT&T Definity PBX with a primary rate interface. The company has been using one primary rate line for a year and plans to add two more lines in the near future, according to John Sharkey, telecommunications product manager.

It is hard to generalize about savings because savings can differ between private and public network implementations. Costs can be greatly influenced by the types of equipment and applications used and by the prices charged by carriers. Pacific Bell, Illinois Bell and Southwestern Bell are the only Bell operating companies that have ISDN tariffs.

Many organizations that participated in early ISDN trials could not identify savings because they received service for free. The Travelers Companies got 20 basic rate lines from Southern New England Telephone at no charge. Wisconsin Bell provided 17 basic rate lines to Alverno College in Milwaukee. U S West supplied primary rate and basic rate lines to Arizona Public Co. "because we were a beta



visor of telecommunications operations and services.

Much of the ISDN in use today is supplied under special contract arrangements. Hardee's Food Systems is using 32 ISDN Centrex lines from Carolina Telephone & Telegraph Co. in Rocky Mount, N.C. In a partnership arrangement with the telco, Hardee's paid part of Carolina Tel's costs of upgrading to ISDN. "We expect Carolina Tel to price it in the $25-per-line range for lines out of the same central office," says Lynn Smith, Hardee's telecommunications director.

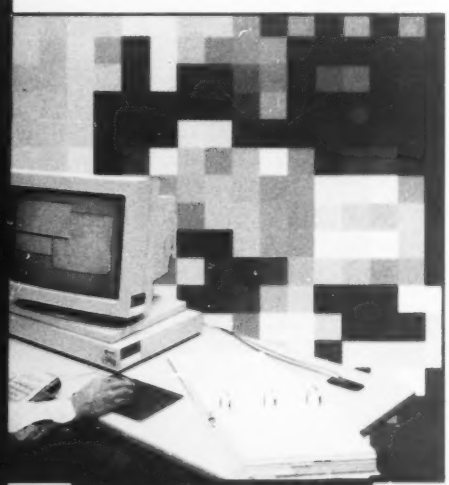
Some users, however, are not happy with the price they are pay-

ing for ISDN. Virtually all who are not using a tariffed service agree that tariffs are badly needed. And many say pricing questions won't be resolved until ISDN is tariffed.

Teleos Communications Inc. pays New Jersey Bell about twice as much for 15 ISDN lines as it is pays for ordinary Centrex lines. "The savings for us right now is non-existent," says Tibor Szekeres, vice president of business development. "But once it's tariffed it should be about $20 a line for basic service and X.25 [packet-switched] service will be $10 extra.

"For $30 we'll be getting twice the capacity and four times the performance plus X.25 and much better voice quality," he says.

Microcom Inc., a West Roxbury, Mass., modem manufacturer, is paying 10 times as much for basic rate



alog service
ele-
phone, acc
ang,
senior produ

"That's why we
60
lines. We have to pay
ISDN costs. They're
pay for all of their risks

One user, who decli
identified, says it cost
pany about three times
to switch from 24 DID trunks to
T-1 with ISDN. "It doesn't seem right. In effect, we returned 22 pairs to the telco to earn revenue from another customer. It seems to me they ought to be reducing our costs," he says.

For many, the savings and benefits come from areas other than the price of the service.

McDonald's Corp. pays about 1.25% more for its 2000 ISDN lines than it paid for regular analog Centrex services from Illinois Bell, but expects to save about 10% to 20% in total telecommunications costs, says Patrick Krause, director of communications.

"The savings in other areas more than offsets the increased line charge," Krause says. For example, uniform wiring is eliminating expensive rewiring costs incurred in department moves or employee changes, he says.

Several users cite that as a significant benefit.

Some of the biggest benefits come from ISDN features that allow networks and people to operate more efficiently. Many users praise the ability to dynamically allocate bandwidth.

"The biggest advantage of ISDN is its flexibility," says Robert Alasker, vice president-management information systems for American Creditors Bureau Inc., which consolidated about 70 dedicated trunks on two primary rate lines from U S West into its Phoenix headquarters.

"We can allocate channels according to our needs at any point. If we have a lot of inward 800 calls in the morning, we can allocate channels for that. We can then reconfigure those channels later in the day for outgoing calls," Alasker says.

Others cite ISDN's ability to deliver 64-kb/s channels. "T-1 was very costly and we were limited to about 19.2 kb/s to the desktop," says Hardee's Smith. Hardee's com-
programmers are in a differ-
n than its mainframe
ching to ISDN, it looks to
mmer like he is still at
adquarters. Without
ISD
have to spend thou-
san
to deliver 144 kb/s
to a u

A numbe
ay the ability
to use auto
identifica-
tion to retrieve customer records from a database has greatly improved the productivity of service agents. Several say that the speed with which ISDN sets up and tears down a call connection has significantly boosted the efficiency of their networks. Others say the network ringback feature is a favorite because it saves them from continually dialing and getting a busy signal.

Another key benefit is the quality of transmission on an ISDN line, according to users contacted by *Telephony*. "We're having to install music-on-hold because it is too quiet on the circuits. Our customers think we've hung up on them. The telephone company has jokingly offered to tariff a little noise for us," says William A. Hurd, senior telecommunications specialist for Arizona Public Service Co.

Early Headaches

Being an early implementer of ISDN isn't all benefits and savings, however. Software and hardware problems plagued many early ISDN users. Several communications managers say they were surprised at how much effort was required to make ISDN invisible to their users. But most say things have gotten better.

McDonald's suffered long delays in finding and resolving problems about a year ago because of a lack of network management tools. "But we've seen major improvement in that," Krause says. Vendors were quick to develop better tools, he adds. "The basic software has matured and the number of problems has been cut in half."

Several users are disappointed that they currently are unable to interconnect several company locations with ISDN. McDonald's is planning to set up ISDN networks in its Atlanta and Milwaukee offices in the near future, and the company also is exploring deploying ISDN in its individual stores. Krause says the company would eventually like to see signaling system 7 connect offices. But until it is available ubiquitously switched 56 or packet-

continued on page 15

LEC ISDN SCOREBOARD

Telco	No. of users	No. of lines	Access	Tariff status	ISDN deployment plans	SS7 deployment plans	Switch vendors
Ameritech	50+	17,000	BRI	Tariffed in Ill. and Ohio Will file others in 1990	Is available from 34% of COs in 6 metro areas Will be available from 90% by end of 1990	Is being rolled out in metro areas	AT&T NTI Siemens
Bell Atlantic	28	5000	BRI	Will file 3rd quarter 1990	Will begin active marketing in 1991, delivery in 1992	56% of COs equipped now, 80% will be by 1991	AT&T NTI Siemens
BellSouth	10+	1000+	BRI PRI	Will file 4th quarter 1990	General deployment will begin in late 1990	Will be available in all metro areas by end of 1990	AT&T NTI Tests with Siemens
Nynex	12	11,747	BRI	Will file mid-1990	N/A	Will be available in Boston by 1991, in New York by 1993	AT&T NTI
Pacific Telesis	6	1270	BRI	Pacific Bell service is tariffed Nevada Bell has no plans	Pacific Bell will offer PRI late 1990 Nevada Bell will expand BRI in Reno-Carson area	Nevada Bell will roll out in Aug. 1991, Pacific Bell in 1st quarter 1992	AT&T NTI
Southwestern Bell	15	22,000 installed 12,000 contracted	BRI	"Starter tariff" approved in Texas, pending in Okla. Will file PRI in 1991	Will be driven by customer demand	Will be available from 300 COs to 70% of users by 1994	AT&T NTI
U S West	25	6000 installed 12,000 contracted	BRI PRI	Will file 1st half 1990	Is available in 12 cities Will be driven by customer demand	Trials in 1991 Available in 1992	AT&T NTI
Centel	2	N/A	PRI	Nevada tariff pending approval Will file others in 1990	Is available in Nev. Will be available soon in Ill. and Fla.	Will be available in Nev., Ill., and Fla. in 1990	AT&T NTI
Contel	5	350	BRI	No filing scheduled	Plans not finalized	Is rolling out SS7 for line information database service	AT&T NTI
GTE	N/A	N/A	BRI PRI	Has not filed, declined to reveal plans	Will roll out in 5 locations in 2nd quarter 1990	Will be available in 1990 and 1991	AT&T NTI
SNET	8	3100	BRI	Will file 2nd quarter 1990	Is being rolled out in 7 metro areas	Available from 7 switching centers and in backbone network	AT&T
United Telecom	2	40	BRI	Will file 1st quarter 1990	Plans not finalized	Plans not finalized	AT&T NTI

Payoff *continued*

switched service will be used.

3M Corp. wants to link its St. Paul, Minn., office with the 3M Austin Center in Texas via SS7, possibly as early as March, says Lou French, manager of 3M's ISDN project in Austin. But that plan depends on local exchange carrier deployment of SS7. Southwestern Bell plans to begin rolling out SS7 in Austin in March, but U S West's plans for SS7 in Minneapolis are longer term.

A Small But Loyal Following

There still are fewer than 150 ISDN subscribers in the United States. Many of the early users and biggest fans are companies developing ISDN products and applications.

For example, Teleos, which uses primary rate and basic rate lines, has developed its own terminal adapter to connect personal computers with local area networks via ISDN. At AT&T Network Systems, which has about 1700 basic rate ISDN lines in its St. Louis and Ballwin, Mo., offices, the computer aided-design group has devised a method of linking a plotter to all its users via ISDN and is looking at applications such as paperless fax and screen sharing for joint editing of presentation graphics.

Motorola Inc., which has lines from an AT&T 5ESS and a Northern Telecom DMS-100 central office switch at its Chicago ISDN lab, has developed an ISDN chip set. 3M, which is using ISDN for multiple call appearances on single-line phones, voice messaging, access to a private long-distance network and some computer links, sells a wide range of network cabling and connecting products. Kodak, Rochester, N.Y., which runs primary rate on a private network, is selling an ISDN still-video transceiver.

With ISDN still in its infancy, users are just now beginning to discover the full range of features and benefits it can offer. It is the nontelecommunications companies that make the most compelling case for ISDN because they have no proprietary interest in seeing the technology succeed. More of them are using ISDN every day, and many of the early users say they plan to add more lines, especially when additional features, applications and CPE become available.

For the most part, these companies and organizations use it for very basic applications such as PC-to-PC file transfers, modem pooling, printer sharing, managing bandwidth, voice messaging, screen sharing and coax elimination.

Advanced data applications on ISDN have been slow to take hold. Companies are not using ISDN to replace local area networks or other high-speed applications. "ISDN in its current basic rate form does not lend itself to high-speed LAN applications. We won't see that until we see some more primary rate devices," says R.D. Peterson, an advanced specialist in 3M's information services and data processing department.

It is ha... al... ...ing ... and ... pu... can be ... by the types ... and applica...

"Our data use is fairly limited. We have some PCs that dial into headquarters," says Alasker of American Creditors Bureau. "But we expect in the next six months to do a lot more data such as file transfers between a host and a client machine. We will probably reallocate a couple of channels we use for voice in the morning to data in the afternoon."

Many users plan to implement more advanced applications in the next year, especially video applications.

Hardee's is considering installing a freeze-frame video camera in each restaurant to snap pictures "to find out who our customers are. Are they mothers with children? Are they construction workers? The camera would give the marketing people a lot of information," says Smith.

Johns Hopkins Health System in Baltimore is using about 400 basic rate ISDN Centrex lines now and expects to be using about 2000 lines by 1995, acco... manager of net... ISDN implemen... kins is using ... data traff... such ... is con... In ad... tion... car... mad... keep... that wou... ...ians ...smit radiog... ...be... ...n dis... t... ...sing pri... ...te ISDN ... also in the ...rks.

Alverno College is looking at video transmission to replace videocassettes to allow faculty to easily monitor and assess the performance of students. The small college tested video on its ... -rate lines and found ... de-quate, but the cost ... high.

"We've been pu... ...cas-sette carts around ... for years. ISDN is ... off carts and onto a ... it would take abou... ...t up two sites for ISDN v... ...-mission," says Frank M... ant vice president for c... tions. "At that price, we do... worth it. The price of equi... would have to drop below $... for us to consider it."

The future of ISDN looks promising, as more applications are developed, equipment prices fall and ISDN islands are interconnected, users say.

The key to making ISDN pay off now, most managers agree, is to keep expectations reasonable, pinpoint specific areas where ISDN can solve a problem or improve communications and test everything thoroughly before cutting over to the new system.

"When you roll all the benefits together, for a small company it really has been worth it," says Porsche's Backe. "And I expect it to get even better as time goes on."